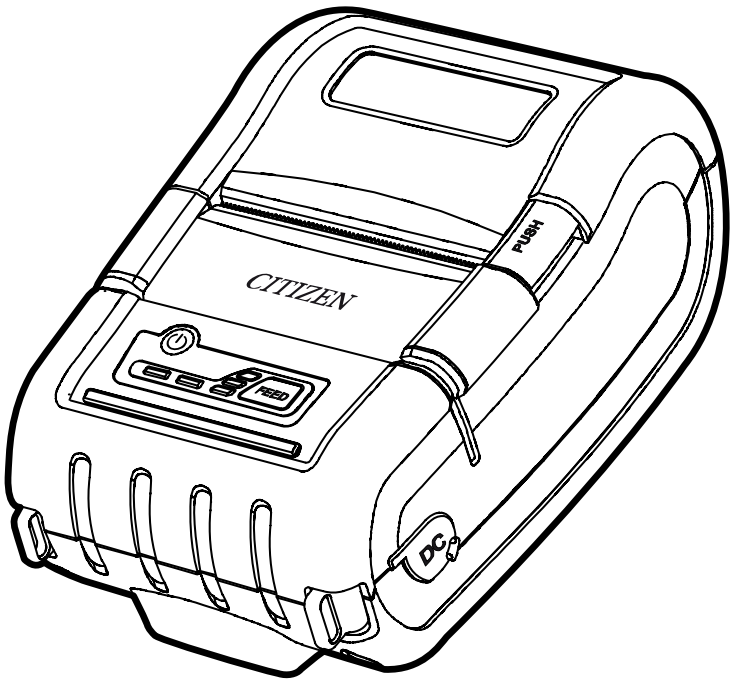
CITIZEN
Micro HumanTech

MOBILE THERMAL PRINTER

MODEL CMP-20 series

Technical Manual

Rev. 1.00



CITIZEN SYSTEMS JAPAN CO., LTD.

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4. Control Command Summary

1. General Specifications

1.1 Printing Specifications

1) Printing method:	Thermal line printing
2) Dot density:	203dpi
3) Printing direction:	Unidirectional with friction feed
4) Printing width:	48mm(1.88"), 384 dot positions (203dpi)
5) Characters per line(ESC Emulation):	Font A: 32
	Font B: 42
6) Printing speed:	80mm/second maximum

☞ **NOTE:** Speeds are switched depending on the applied voltage to the printer and head temperature conditions automatically.

☞ **NOTE:** There may be variations in printing after switching the mode of the printing speed. To prevent this for logo printing with **ESC*** command, using a downloaded bit image is recommended. Change in printing speed does not occur during downloaded bit image printing.

7) Line spacing (default):	1/6 inch (4.23mm)
	Programmable by control command.

1.2 Character Specifications

1) Number of characters: Alphanumeric characters: 95
Extended graphics 128 × 18 pages
(including one space page)
International characters: 14
① English
② Hangul
③ Chinese (GB2312,Big5)
④ Kanji

2) Character structure: Font A: 12 × 24
Font B: 9 × 17
Hangul, Chinese: 24 × 24
Font A is selected as the default

3) Character size:

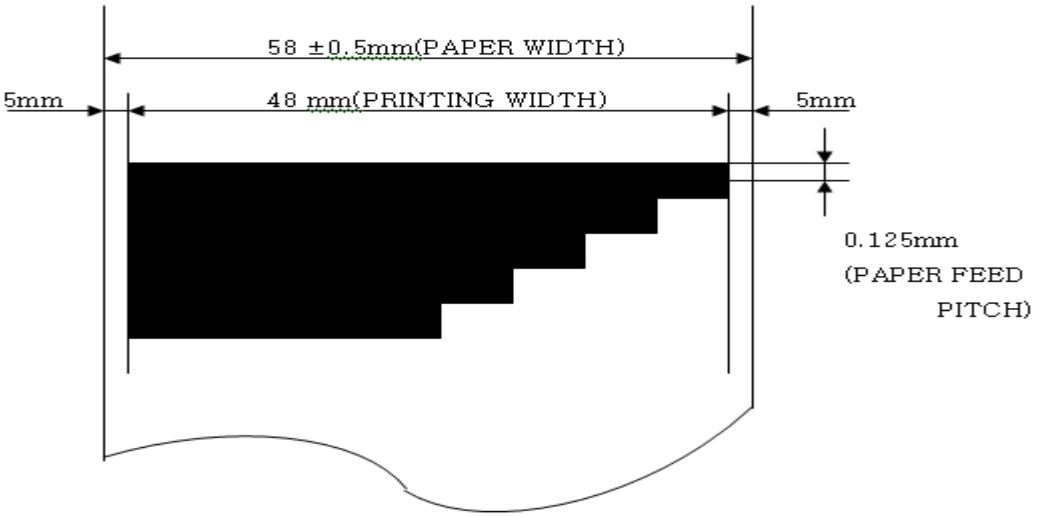
	EPSON Emulation
1)Dot density	0.125 × 0.125mm/dot (203*203dpi)
	[dpi: dots per 25.4mm{1"}]
2)Printing direction	Unidirectional With friction feed
3)Paper width	58.5mm(2.28")
4)Maximumprintable area	48mm(384dots)
5)Character / line	
Font A (12 × 24)	32
Font B (9 × 17)	42
Kanji Font (24 × 24)	16

1.3 Paper Specification

1) Paper type: Specified thermal paper
2) Form: Paper roll
3) Paper width: 58 ±0.5mm (2.28" ±0.02")
4) Paper roll size: Roll diameter : Maximum 48mm
5) Paper roll spool diameter: Inside: 12mm(.47")
Outside: 18mm(.71")

☞ **NOTE:** Paper must not be pasted to the paper roll spool.

1.4 Printable Area



1.5 Internal Buffer

1) Receive buffer: 4Kbyte

1.6 Electrical Characteristics

1) Supply voltage: +7.4VDC , 1800mAH Li-ion Battery
2) Current consumption :
   Operating: Approx. 1.5A(at ASCII Printing)
   Peak:Approx. 4A(at print duty 100%, For 10 seconds or less)
   Stand-by: Approx. 0.1A

1.7 EMI and Safety Standards Applied

1) UL: Safety – EN 60950-1:2001+A11:2003
   EMS – EN55022:98+A1:2000+A2:2003
   – EN55024:98+A1:2001+A2:2003
   – EN301 489-1 V1.6.1
   – EN301 489-17 V1.2.1
   RF – EN 300 328 V1.7.1(2006-10)

1.8 Reliability

1) MCBF: 50 million lines
   (based on an average printing rate of 12.5% with paper thickness in the range 65 ㎛ to 75 ㎛).

1.9 Environmental Conditions

1) Temperature:	Operating:	5° to 45°C
	Storage:	-20° to 60°C (except for paper)
2) Humidity:	Operating:	10 to 90%RH
	Storage:	10 to 90%RH (except for paper)

2. Configuration

2.1 RS-232 serial interface

2.1.1 Specifications

Data transmission: Serial
Synchronization: Asynchronous
Handshaking: DTR/DSR or XON/XOFF control
Signal levels: MARK= -3 to –15V: Logic “1”
SPACE= +3 to +15V: Logic “0”
Baud rage: 4800, 9600, 19200, 38400,57600,115200 bps
Data word length: 7 or 8 bits
Parity Settings: None, even, odd
Stop bits: 1 or more
Connector (printer side): Female DSUB-25 pin connector

☞ **NOTE:** The data word length, baud rate, and parity depend on the Software-Tool settings.

2.1.2 Switching between on-line and off-line

The printer does not have an on-line/off-line switch.
The printer goes off-line:

- •Between when the power is turned on (including reset using the interface)
- •During the self-test.
- •When the cover is open.
- •During paper feeding using the paper feed button.
- •During macro executing stand by status.
- •When a temporary abnormality occurs in the power supply voltage.
- •When an error has occurred.

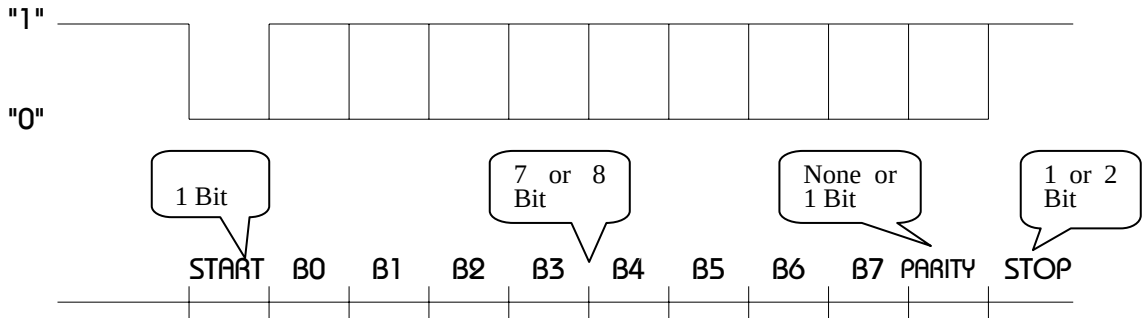
2.1.3 Interface connector terminal assignments and signal functions

PIN	SIGNAL	I/O	DESCRIPTION
1	RXD	-	Printer receive data line RS-232C level
2	TXD	-	Printer transmit data line RS-232C level
3	DTR	Output	Printer handshake to host line RS-232C level
4,5,6,7,8	GND	-	System Ground

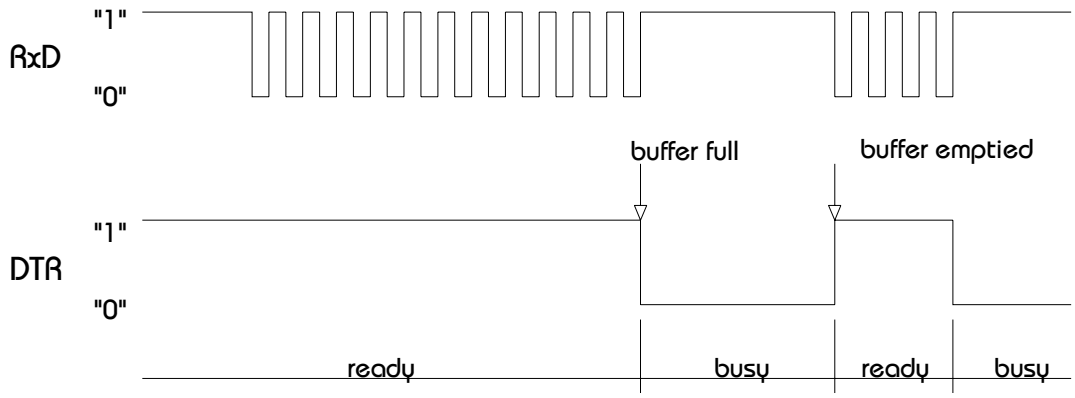
2.1.4 Serial interface connection example

Host side		Printer side
TXD	.....	RXD
DSR	.....	DTR
RXD	.....	TXD
FG	.....	FG
SG	.....	SG

DETAILS: ◦Set the handshaking so that the transmit data can be received.
◦Transmit data to the printer after turning on the power and initializing the printer.



< Figure 2.1 Serial transmission bit frame >



< Figure 2.2 Line transmission with protocol >

2.2 USB Interface

PIN	SIGNAL	I/O	DESCRIPTION
1	+5V	-	+5V
2	DATA-	-	Printer transmit data line
3	DATA+	-	Printer transmit data line
4	GND	-	System Ground

1) Specifications
Data transmission: USB 2.0
Connector: USB “B” type connector

2) USB interface connection example

Host side		Printer side
VCC	……	VCC
DATA+	……	DATA+
DATA-	……	DATA-
GND	……	GND

2.3 Bluetooth Interface (Option)

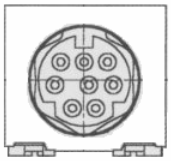
1) The printer can be connected to devices equipped Bluetooth communication capacity (PDA, PC, etc…)
2) Use the Bluetooth connection function suppoeted by the device to connect to the printer

Classifications	Description
Bluetooth Spec.	Bluetooth V2.0 / Class2(10m)
Frequency	2.4GHz ISM BAND
Modulation method	FH method (Frequency hopping spectrum diffusion method)
Hypothetical interference distance	10m
Transfer rate	The communication speed between Bluetooth and the printer is 115.2kbps.
Data bit / Parity bit / Stop bit	8 Data bit / Noparity / 1 Stop bit Fixed.
Transfer capacity	Up to +4 dBm (class 2)
PIN code	“0000” Fixed.
Profile	Serial Port Profile (SPP)

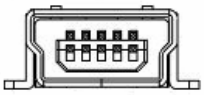
2.4 Wifi Interface (Factory Option)

Item		Content
Wireless	Standard	802.11b, 802.11g
	Communication Speed(Max)	54M
	Transmission Distance(Max)	100m(Indoors without obstructs))the distance Depending on the environment)
	chanel	1-14
	Safety	64/128 WEP, WPA
The interface module	Condition's monitor	Special configure tools Browser
	Configuration management	Special configure tools Browser
	Firmware updating	TFTP
	Basic communication protocol	ARP, RARP, IP, ICMP, TCP, UDP
	Printing communication mode	Port 9100, LPR/LPD
	State demand	The Software package (include DLL and Routines), browser
	Average communication speed	>50kByte/s

2.5 Interface Connector



<Serial connector>

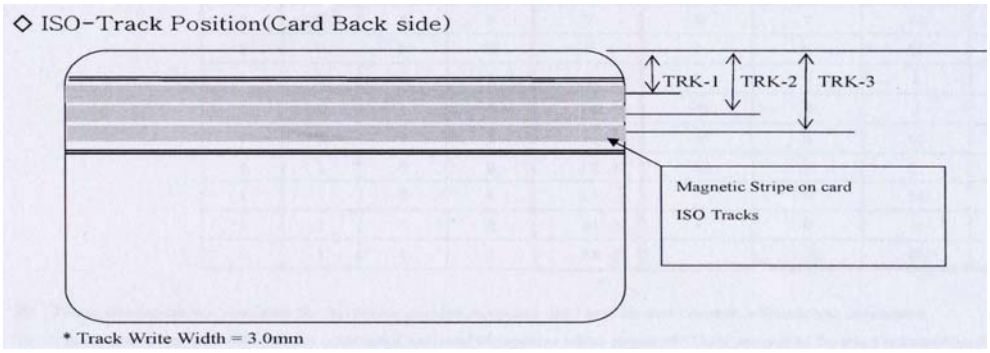


<USB Connector>

3. Module Configuration

3.1 MSR

Item	Content
Card Standard	ISO 7811/2, JIS
Dual Track	1 , 2 Track or 2 ,3 Track
CardSwipe Speed	10cm ~ 15cm / sec (4 ~ 6 inch/sec)
Magnetic Head Life	300,000passes (minimum)
Power Consumption(3.0VDC)	Standard : 3mA(Dual) Operation : 500~900uA(Dual)
Reading Track Width	1.5mm
Operation Temperature and Humidity	-20℃ ~ +60℃ , 20% ~ 90% RH
Conservation Temperature and Humidity	-35℃ ~ +75℃ , Less than RH



3.2 IC-CARD

Item	Content
Host Interface	-Default Baud Rate : 9,600bps
Card Interface	- Internal 1Ch(Default)
Ambient operating Temperature	0℃ to +70℃
Power supply Voltage range	4.7V to 5.5V
Input High Voltage RST,XTAL1	0.7Vcc Min Vcc+0.5Max
Input Low Voltage	-0.5V Min 0.2Vcc – 0.1Max
Output Card Supply Voltage	2.75V < < 3.25V (CRD_Vcc = 3V)
Output Card Current Limit Time Out	4mS Typ.
Output Card Over current Limit	100mA MAX.

4. Control Command summary

No.	Command	Function	
1	HT	Horizontal tab	
2	LF	Print and line feed	
3	CR	Print and carriage return	
4	FF	Print end position label to start printing	
5	CAN	Cancel print data in page mode	
6	DLE EOT	Real-time status transmission	
7	DLE ENQ	Real-time request to printer	
8	ESC FF	Print data in page mode	
9	ESC SP	Set character right-side spacing	
10	ESC !	Set print mode	
11	ESC $	Set absolute print position	
12	ESC %	Select/cancel user-defined character set	
13	ESC &	Define user-defined characters	
14	ESC *	Set bit image mode	
15	ESC -	Turn underline mode on/off	
16	ESC 2	Set 1/6 inch line spacing	
17	ESC 3	Set line spacing using minimum units	
18	ESC ?	Cancel user-defined characters	
19	ESC @	Initialize printer	
20	ESC D	Set horizontal tab positions	
21	ESC E	Select emphasized mode	
22	ESC G	Select double-strike mode	
23	ESC J	Print end feed paper using minimum units	
24	ESC L	Select page mode	
25	ESC M	Select character font	
26	ESC R	Select international character set	
27	ESC S	Select standard mode	
28	ESC T	Select print direction in page mode	
29	ESC V	Set/cancel 90° cw rotated character	
30	ESC W	Set printing area in page mode	
31	ESC \	Set relative position	
32	ESC a	Align position	
33	ESC d	Print and feed paper *n* lines	
34	ESC t	Select character code table	
35	ESC {	Set/cancel upside-down character printing	
36	FS p	Print NV bit image	
37	FS q	Define NV bit image	
38	GS !	Select character size	
39	GS $	Set absolute vertical print position in page mode	
40	GS *	Define downloaded bit image	
41	GS /	Print down-loaded bit image	
42	GS B	Turn white/black reverse printing mode on/off	
43	GS H	Select printing position of HRI characters	
44	GS I	Transmit printer ID	
45	GS L	Set left margin	
46	GS W	Set printing area width	
47	GS \	Set relative vertical print position in page mode	
48	GS a	Enable/disable Automatic Status Back(ASB)	
49	GS f	Select font for HRI characters	
50	GS h	Set bar code height	
51	GS k	Print bar code	

52	GS r	Transmit status	
53	GS v 0	Print raster bit image	
54	GS w	Set bar code width	
< Add >			
101	GS S C	Set Serial Baudrate	
102	DLE EOT n	Selects card read mode / Cancel card read mode	
103	GS S P	Power Save Mode	

Command Descriptions

Command Notation

[Name] The name of the control command.

[Format] The code sequence.
In this description, < > H denotes hexadecimal numbers, < >denotes decimal numbers and < > B denotes binary numbers.
[ ] k indicates the contents of the [ ] should be repeated k times.

[Range] The allowable range for the arguments.

[Description] Description of the command function.

[Details] If necessary provides important information on setting and using the printer command.

[Default] The default values for the commands.

[Reference] List related commands.

[Example] Example of using the commands.

The numbers denoted by <>H is hexadecimal.
The numbers denoted by <>B is binary**.**